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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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HAMILTON, BROOK, SMITH & REYNOLDS, P.C.
530 VIRGINIA ROAD
P.O. BOX 9133
CONCORD, MA 01742-9133

EXAMINER	
KIM, DAVID S	

ART UNIT	PAPER NUMBER
2613	

DATE MAILED: 08/09/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/060,945	CARRICK ET AL.	
	Examiner	Art Unit	
	David S. Kim	2613	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 January 2002 and 01 August 2002*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-45* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-45* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 January 2002* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *01 August 2002*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following features must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

In claim 26, the "time-to-frequency transformation" is not shown.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

2. **Claims 12 and 38-39** are objected to because of the following informalities:

In claim 12, antecedent basis is lacking for "wherein the bandwidth is less than about 1 Hz". The specification (p. 21, l. 25-28) appears to associate this bandwidth with the "bandwidth" of parent claim 11. Accordingly, claim 12 depends on claim 1 where it should depend on claim 11.

In claim 38, the preamble uses "process" where "processor" may be intended.

In claim 39, under limitation (iii), "detector characterize" is used where "detector to characterize" may be intended.

Appropriate correction is required.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. **Claims 1-4, 6-10, and 14-15** are rejected under 35 U.S.C. 102(b) as being anticipated by Wong et al. (U.S. Patent No. 5,062,703, hereinafter "Wong").

Regarding claim 1, Wong discloses:

A method for characterizing an optical transmission path in a network with network traffic, the method comprising:

modulating (col. 5, l. 3-18) an optical signal with a pilot tone and outputting the modulated optical signal onto the optical transmission path;

sweeping (col. 5, l. 6) the pilot tone across a frequency range;

detecting amplitudes and phases of the pilot tone along a forward path (e.g., path to 16B in Fig. 3) and a reflected path (e.g., path to 16A in Fig. 3) of the optical transmission path; and

characterizing the optical transmission path based on the detected amplitudes and phases (e.g., Figs. 5A-5B).

Regarding claim 2, Wong discloses:

The method as claimed in claim 1 wherein the characterizing includes determining at least one impairment (col. 6, l. 4-36) in the optical transmission path.

Regarding claim 3, Wong discloses:

The method as claimed in claim 2 wherein the optical transmission path is a fiber; and

the determining includes determining a disconnection, crimp, obstruction, defect, or assembly error (col. 6, l. 4-36).

Regarding claim 4, Wong discloses:

The method as claimed in claim 1 wherein the characterizing includes

determining dispersion in at least a portion of the optical transmission path (col. 6, l. 4-7).

Regarding claim 6, Wong discloses:

The method as claimed in claim 1 wherein the detecting is co-located (e.g., under one reading of "co-location", notice co-location of 16A and 16B in Figs. 2-3 within the bounds of a local area).

Regarding claim 7, Wong discloses:

The method as claimed in claim 1 wherein the detecting is non-co-located across a length of the optical transmission path having a known characteristic (e.g., under another reading of "co-location", notice that 16A and 16B are separate devices in separate locations, non-co-located).

Regarding claim 8, Wong discloses:

The method as claimed in claim 1 wherein the sweeping of the pilot tone maximizes the spatial resolution of the measurements (col. 11, l. 16-25).

Regarding claim 9, Wong discloses:

The method as claimed in claim 8 wherein the sweeping ranges between about 0.5 MHZ and about 2.5 MHZ (col. 5, l. 4-18 teaches a range that encompasses this range).

Regarding claim 10, Wong discloses:

The method as claimed in claim 1 wherein the sweeping includes selecting modulation frequencies essentially absent coherent modulations on the optical signal (the range of col. 5, l. 4-18 includes Applicant's range, which includes modulation frequencies that are essentially absent coherent modulations on the optical signal).

Regarding claim 14, Wong discloses:

The method as claimed in claim 1 wherein the characterizing is based on a relative measurement of amplitudes and phases (note the comparison of the amplitudes and phases in 24 of Fig. 3).

Regarding claim 15, Wong discloses:

The method as claimed in claim 1 wherein the optical transmission path is a fiber (col. 4, l. 66).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. **Claims 11-13 and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong, as applied to claim 1 above, further in view of Selvan et al. ("Network monitoring for passively split optical fibre networks", hereinafter "Selvan").

Regarding claim 11, Wong does not expressly disclose:

The method as claimed in claim 1 wherein the detecting of the pilot tone includes filtering the detected optical signal with a bandwidth sufficiently narrow to reject noise while preserving the pilot tone in a manner supporting accuracy requirements.

However, it is known to practice frequency domain reflectometry methods in environments that would employ such filtering. For example, Selvan teaches the use of frequency domain reflectometry methods in optical fiber networks. In particular, notice that the reflectometer operates at an "out-of-band" wavelength (Selvan, p. 5/2, "Real-time monitoring" paragraph) during operation of normal network services. At the time the invention was made, it would have been obvious to one of ordinary skill in the art to employ frequency domain reflectometry, such as that of Wong, in optical fiber networks, as taught by Selvan. One of ordinary skill in the art would have been motivated to do this since frequency domain reflectometry has advantages over other types of reflectometry, such as high resolution and high dynamic range (Selvan, p. 5/1, middle paragraph). Operating the reflectometer at an "out-of-band" wavelength generally leads one to implement filtering to reject undesired spectral components, such as noise, while preserving the reflectometer's signal.

Regarding claim 12, Wong teaches a resolution of 1 Hz (col. 5, l. 5).

Regarding claim 13, Wong teaches filtering through computation (col. 6, l. 46-59), which implies filtering through a digital processor. Such digital processor filters are known to be adaptable.

Regarding claim 16, Wong in view of Selvan teaches:

The method as claimed in claim 1 used in a wavelength division multiplexed (Selvan, implied use of multiple wavelengths, one for the "out-of-band" wavelength under "Real-time monitoring" on p. 5/2

and one for the normal traffic) or time division multiplexed system (Selvan, PON in Fig. 1, PONs are often time-division multiplexed systems).

7. **Claims 5, 17-22, and 24-45** are rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Selvan, further in view of Akiyama et al. (U.S. Patent No. 5,982,530, hereinafter "Akiyama").

Regarding claim 5, Wong does not expressly disclose:

The method as claimed in claim 4 further including automatically correcting the dispersion.

However, automatic correction of dispersion is a well-known technique in the art. For example, Akiyama teaches such automatic correction after the dispersion is measured (Akiyama, e.g., Figs. 21(A)-(B), 22(A)-(B), 24(A)-(B), 25(A)-(B), 26, 27(A)-(B)). At the time the invention was made, it would have been obvious to one of ordinary skill in the art to implement some means for automatically correcting the dispersion detected by Wong. One of ordinary skill in the art would have been motivated to do this since dispersion can change with time (Akiyama, col. 2, l. 19-24). Automatic correction provides precise compensation (Akiyama, e.g., col. 32, l. 5-13), which facilitates higher transmission speeds (Akiyama, col. 1, l.56-62; col. 32, l. 5-13).

Regarding claim 17, claim 17 is an apparatus claim that corresponds largely to the method claim 1. Therefore, the recited steps in method claim 1 read on the corresponding means in apparatus claim 17. Claim 17 also includes limitations absent from claim 1. Wong in view of Selvan and Akiyama also disclose these limitations:

the optical transmission path carrying network traffic (Selvan, p. 5/2, "Real-time monitoring" means reflectometry operation while the path carries network traffic).

Regarding claims 18-21, claims 18, 19, 20, and 21 are apparatus claims that introduce limitations that correspond to the limitations introduced by method claims 2, 3, 4, and 5, respectively. Therefore, the recited steps in method claims 2-5 read on the corresponding means in apparatus claims 18-21.

Regarding claim 22, Wong in view of Selvan and Akiyama discloses:

The apparatus as claimed in claim 17 wherein the detection unit includes at least one optical detector (Wong, e.g., 16A or 16B in Fig. 3) that senses the pilot tone and provides a corresponding electrical signal.

Regarding claim 24, Wong in view of Selvan and Akiyama discloses:

The apparatus as claimed in claim 22 further including at least one receiver coupled to each optical detector to convert the electrical signal to digital data (Wong, implied by "digital signal processing" in col. 5, l. 62-64).

Regarding claim 25, Wong in view of Selvan and Akiyama discloses:

The apparatus as claimed in claim 24 wherein the processing unit employs a frequency to time transformation to assist in characterizing the optical transmission path (Wong, Figs. 5A-5B).

Regarding claim 26, Wong in view of Selvan and Akiyama discloses:

The apparatus as claimed in claim 24 wherein the processing unit executes a time-to-frequency (Wong, notice the frequency domain graph in Fig. 7A, such graphs are often obtained through time-to-frequency Fourier transformation) transformation to assist in characterizing the optical transmission path.

Regarding claims 27-36, claims 27, 28, 29, 30, 31, 32, 33, 34, 35, and 36 are apparatus claims that introduce limitations that correspond to the limitations introduced by method claims 6, 7, 8, 9, 10, 11, 12, 13, 14, and 16, respectively. Therefore, the recited steps in method claims 6-14 and 16 read on the corresponding means in apparatus claims 27-36.

Regarding claim 37, claim 37 is an apparatus claim that introduces limitations that correspond to the limitations introduced by apparatus claim 17. Therefore, the recited means in apparatus claim 17 read on the corresponding means in apparatus claim 37.

Regarding claim 38, claim 38 is a computer-readable medium claim that introduces limitations that correspond to the limitations introduced by apparatus claim 17. Therefore, the recited means in apparatus claim 17 read on the corresponding steps in computer-readable medium claim 38.

Regarding claims 39-45, claims 39, 40, 41, 42, 43, 44, and 45 are system claims that introduce limitations that correspond to the limitations introduced by claims 17, 18, 20, 21, 31, 15, and 36,

respectively. Therefore, the recited limitations in claims 15, 17-18, 20-21, 31, and 36 read on the corresponding means in system claims 39-45.

8. **Claim 23** is rejected under 35 U.S.C. 103(a) as being unpatentable over Wong in view of Selvan and Akiyama, as applied to claim 22 above, and further in view of Lemus et al. (U.S. Patent No. 6,111,676, hereinafter "Lemus").

Regarding claim 23, Wong in view of Selvan and Akiyama teaches:

The apparatus as claimed in claim 22 further including a dual coupler (Wong, e.g., 26 in Fig. 3) coupled to the optical transmission path and connected to each optical detector, wherein the dual coupler provides between about 2% and 5% (known in the art, as shown by Lemus, col. 4, l. 16-19) of the optical signal to the at least one optical detector.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Johnson is cited to show an optical reflectometer that detects a signal along a forward path and a reflected path. Fleuren is cited to show another optical reflectometer that detects a signal along a forward path and a reflected path. Michishita is cited to show an optical reflectometer used in an in-service state in a WDM system. Ito et al. is cited to show the measurement of dispersion by an optical frequency domain reflectometry. Sankawa et al. is cited to show the use of optical reflectometry in an in-service state. Verhoof is cited to the use of optical frequency domain reflectometry in an in-service state. Von Der Weid 7/97 is cited to show further details about optical frequency domain reflectometry. Von Der Weid 11/97 is cited to show the use of optical frequency domain reflectometry with components for WDM systems.

Any inquiry concerning this communication or earlier communications from the exaininer should be directed to David S. Kim whose telephone number is 571-272-3033. The examiner can normally be reached on Mon.-Fri. 9 AM to 5 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth N. Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

DSK

KENNETH VANDERPUYE
SUPERVISORY PATENT EXAMINER